

Data Sheet BSS-D50.8-T3.5

THz Beam Splitter



Table of Contents

Page

| | | |
|----------|------------------------------------|----------|
| 1 | General | 1 |
| 2 | Specification | 1 |
| 3 | Application Note | 1 |
| 3.1 | Transmittance and Reflectance..... | 2 |
| 3.2 | Resolution Bandwidth..... | 3 |
| 3.3 | Anti-Reflex Coating..... | 4 |
| 4 | Contact Details | 5 |

1 General

THz beam splitter (**BSS-D50.8-T3.5**) made from HRFZ-Silicon for single pass applications.

2 Specification

| | |
|------------------|----------------|
| Material | HRFZ-Silicon |
| Resistance | > 10 kΩ*cm |
| Refractive index | 3.41 |
| Diameter | 50.8 ± 0.05 mm |
| Thickness [T] | 3.5 ± 0.05 mm |
| Parallelism | 30" |

3 Application Note

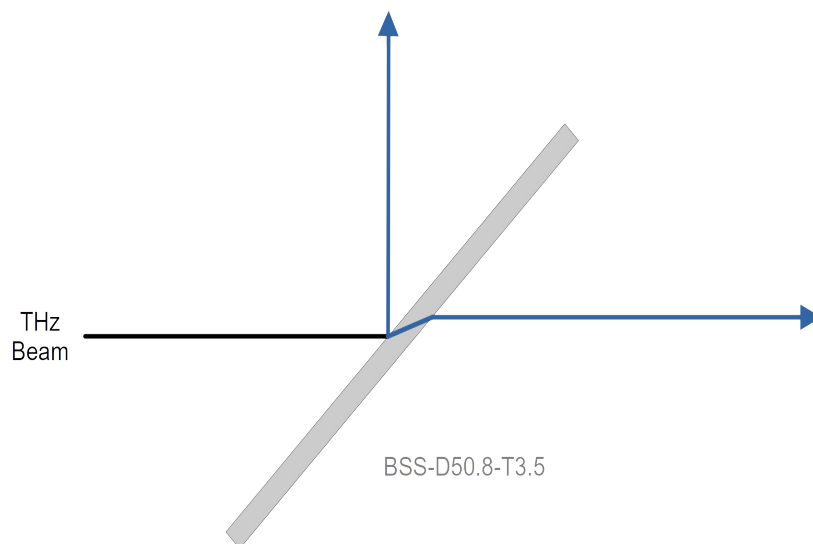


Figure 1: **BSS-D50.8-T3.5**

The THz beam splitter (**BSS-D50.8-T3.5**) is designed for single-pass applications. A THz beam splitter for multi-pass applications is available on request.

3.1 Transmittance and Reflectance

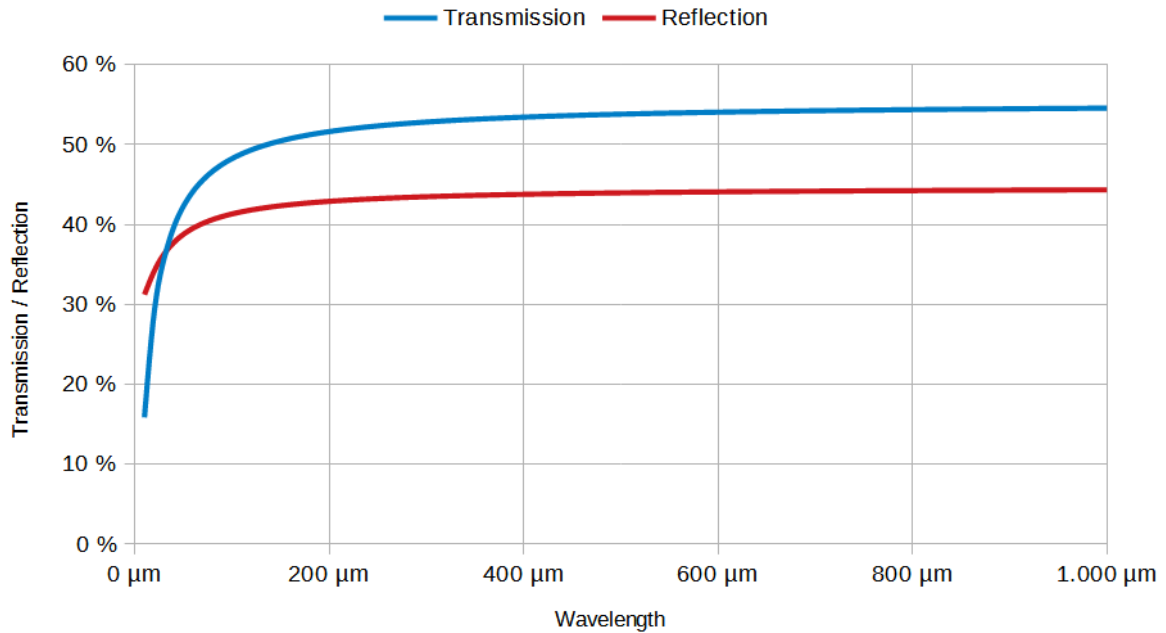


Figure 2: Transmittance and Reflectance of HRFZ-Silicon (T 3.5 mm)
Randomly polarized (AOI 45°; Uncoated)
RBW = ∞

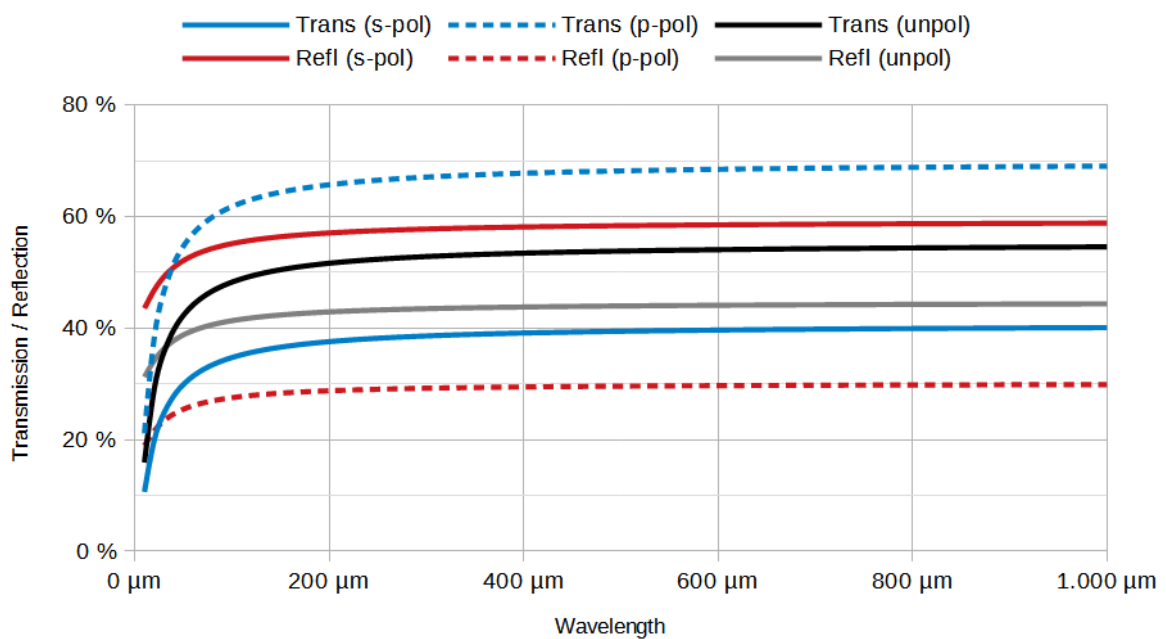


Figure 3: Transmittance and Reflectance of HRFZ-Silicon (T 3.5 mm)
s- & p-polarized (AOI 45°; Uncoated)
RBW = ∞

3.2 Resolution Bandwidth

The resolution bandwidth (rbw) has a major impact on the measurement results. At a certain level, the interference between the reflection of the first and second surface of the THz beam splitter becomes visible as "ripples" as shown in figure 4.

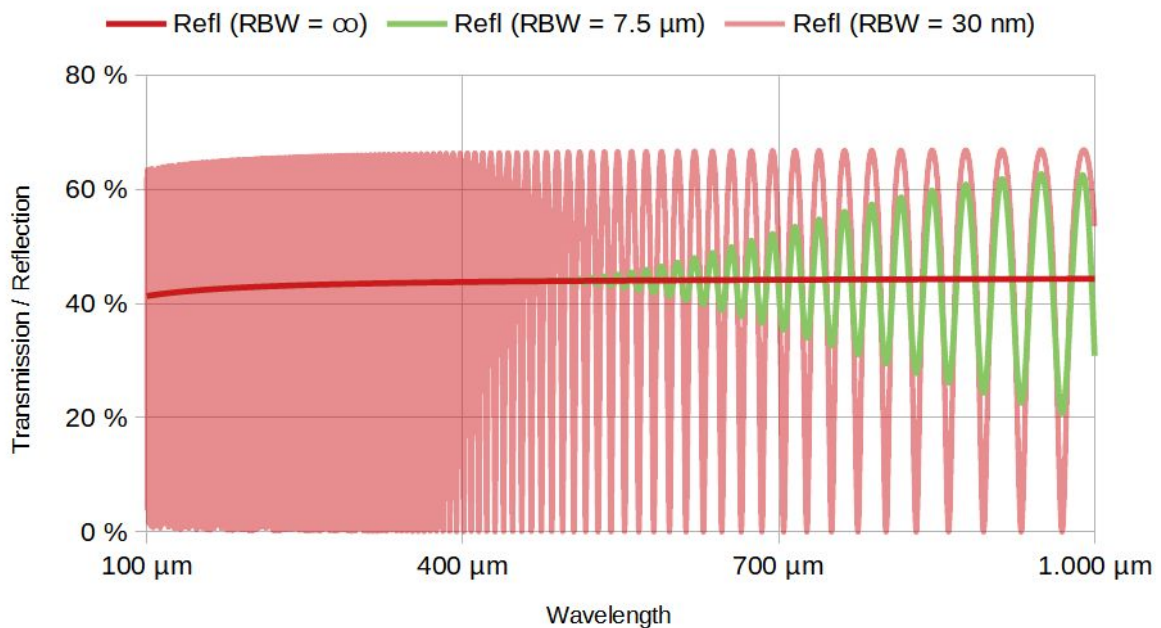


Figure 4: Impact of the resolution bandwidth on HRFZ-Silicon (T 3.5 mm)
Randomly polarized (AOI 45°; Uncoated)

To avoid this behaviour, we recommend to meet the following criteria for the minimum resolution bandwidth:

$$\frac{\Delta\lambda}{\lambda} > \frac{1}{40}$$

The influence of resolution bandwidth can be reduced with our optional anti-reflex coating (⇒ section 3.3).

3.3 Anti-Reflex Coating

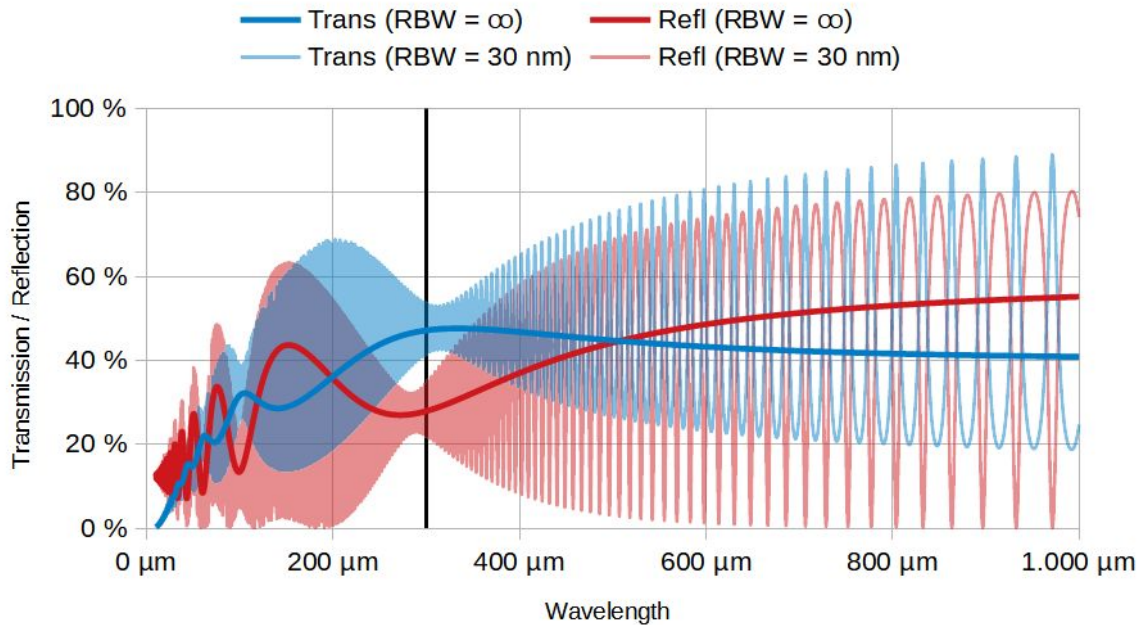


Figure 5: Transmittance and Reflectance of HRFZ-Silicon (T 3.5 mm) Coated to minimize the ripple @ 300 μm / 1 THz s-polarized (AOI 45°)

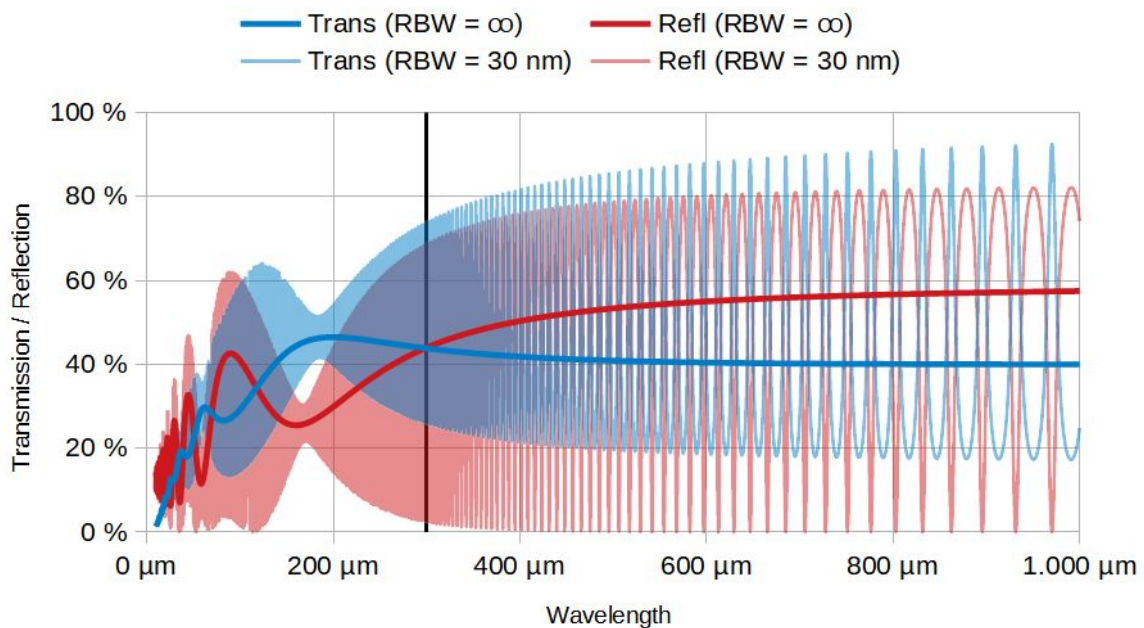


Figure 6: Transmittance and Reflectance of HRFZ-Silicon (T 3.5 mm) Coated to equal transmission and reflection @ 300 μm / 1 THz s-polarized (AOI 45°)

4 Contact Details

BATOP GmbH
Stockholmer Straße 14
07747 Jena
Germany

E-Mail: info@batop.de (Sales)
 thz@batop.de (Support)
Phone: +49 3641 634009 0
Fax: +49 3641 634009 20